



Transit Alternatives

- Additional Analysis
- HCT EIS Recommendations



Additional I-90 Analysis

- Update on I-90 two-way transit project
- Modeling for I-90 LRT without added HOV
- Geometric and traffic evaluation for I-90 LRT w/ 3 GP and HOV
- Structural feasibility analysis of light rail on I-90
- Evaluation of I-90 parallel HCT bridge



Pittsburgh, PA



I-90 Two-Way Transit Project Outcomes

- FHWA concurs with including in the EIS an alternative that adds HOV lanes to outer roadway (R-8a)
- ST Board and WSDOT identify following EIS alternatives in addition to No-Action
 - R2b: Two-way center roadway
 - R5 & R5modified: Transit-only shoulders
 - R8a: Added HOV lanes



Modeling for I-90 LRT Without Added HOV

Loss of I-90 HOV capacity increases burden on SR 520:

- Trans-Lake vehicle and person trips lowered by 2% in the peak period and 1% daily
- On SR 520, vehicle and person trips increase by 7% in the peak period and 2% daily



I-90



Trans-Lake Washington Project

Geometric evaluation for I-90 LRT w/ 3 GP and HOV

LRT operations in the center roadway require less space than current reversible lanes and:



- would not preclude adding HOV lanes to the outer roadway
- would slightly improve the geometric feasibility of adding HOV lanes to the outer roadway (but over 60% of the corridor would not have significant improvements)



Traffic Evaluation for I-90 LRT w/ 3 GP and HOV

Compared to I-90 Two-Way Transit Project
Alternative R-8a:

- Trans-Lake Alternative 2 would have nearly identical traffic volumes and congestion on the I-90 outer roadways.
- Trans-Lake Alternative 3 would have traffic volumes 3% higher and similar or slightly higher congestion on the I-90 outer roadways.
- Trans-Lake Alternative 4 would have traffic volumes 5% lower and similar or somewhat decreased congestion on the I-90 outer roadways.



Trans-Lake Washington Project

I-90 Light Rail Implementation Feasibility Analysis



Vancouver, Canada

- Structural Analysis by WSDOT Bridge Division
- Review of Feasibility of a rail joint across the transition from fixed to floating bridge structure



I-90 Light Rail Structural Analysis

Added weight from light rail can be mitigated using reasonable methods - Cost \$11-12 m.

- Replace existing south concrete side barrier with a cable railing
- Remove existing ballast within the floating bridge pontoon cells
- Replace 1 inch of existing concrete overlay in the center lanes with a 1/4 inch concrete polymer overlay



I-90 Light Rail Joint

Modern rail bridges with similar joint movements

- Tagus River Bridge in Lisbon, Portugal
- Skytrain Bridge in Vancouver across the Fraser River



Lisbon, Portugal



I-90 Floating Bridge Motions Compared to Other Rail Bridges

Type of Motion	Total Required for LRT	Tagus River Bridge	Skybridge Vancouver
Longitudinal	+/- 2'-0.5"	+/- 5'	+/- 1'-1.1"
Horizontal	+/- 1.1 Degrees	Not Specified	Not Specified
Vertical Rotation	2.2 Degrees (Downward)	+/- 3.43 Degrees	+/- .75 Degrees



Parallel Bridge Analysis

A “worst case” scenario for LRT in I-90 corridor is that LRT would require its own, separate floating bridge parallel to I-90:

- Construction cost is \$700 million higher than HCT component of Trans-Lake Alternatives 2,3,4;
- This is still nearly \$1.5 billion less than a comparable SR 520 route;
- Environmental impacts would be slightly higher, particularly in shoreline areas, but overall environmental performance is similar.



Newburgh-Beacon, NY



Recommendations

- Near term transit improvements on SR 520 and I-90
- Include HOV/BRT improvements in Trans-Lake EIS
- I-90 remains the preferred crossing for future HCT
- Explore preserving/
not precluding
SR 520 HCT



SR 520



Near Term Transit Improvements

- Improved bus service is the most cost-effective way to increase Trans-Lake ridership.
- Service frequencies and hours of operation will be expanded over the next 5 years as per Regional Express plans.
- I-90 Two-Way Transit Project and HOV/BRT on SR 520 would support doubling of Trans-Lake ridership over the next 20 years.





Transit in EIS Alternatives

- Plan for SR 520 HOV/BRT lanes with 4' buffer.
- Study direct access connections at U District, South Kirkland, I-405 and Overlake.
- BRT stations should replace functions of existing flyer stops at Montlake, Evergreen Point and Yarrow Point.
- Do not advance South Lake Union busway any further due to cost, impacts and capacity constraints.
- Include connections to/from I-5 reversible lanes.
- With “No Action” in 2020, transit capacity downtown is reached and an HCT line may be required to accommodate demand beyond 2020.



Preferred Corridor for HCT

All analysis conducted to date results in the conclusion that I-90 is still the preferred location for a long term HCT line:

- Better service pattern; through Bellevue
- Better operations; balances demand with Central LINK
- Similar ridership to SR 520 options
- Lower capital costs (\$1.8-\$2.3B)
- Less environmental impact





HCT ROW Preservation in SR 520 Corridor

Would 2 rail corridors across Lake Washington ever be needed?

- 2020 model results show a rail line across the lake would only be at 50% capacity; therefore it could handle substantial growth beyond 2020.
- Ridership is difficult to predict for the very long term and is beyond the range of the EIS analysis (2030).
- The project team is examining EIS implications of preserving, accommodating or not precluding the HCT ROW in SR 520 corridor.